

FEASIBILITY STUDY

US 19

From Hughes Branch Road (SR 1152) in Bryson City
To US 441-North In Cherokee

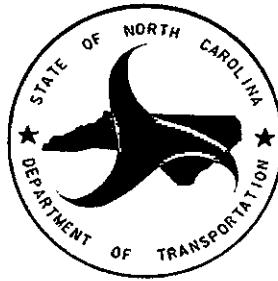
Swain and Jackson Counties

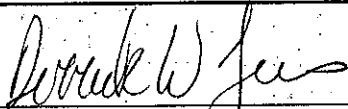
Division 14

FS-0114A


Prepared For:

N.C. Department of Transportation





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4/27/04

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US 19
FROM SR 1152 IN BRYSON CITY
TO US 441-NORTH IN CHEROKEE
FS-0114A

I. General Description

This feasibility study addresses improvements to US 19 from SR1152 (Hughes Branch Road) in Bryson City (Swain County) to US 441-North in Cherokee (Jackson County). Figure 1 is a vicinity map of the project's location. This project study includes several considerations to improve US 19. The US 19 improvements studied include widening the existing facility to a three-lane curb-and-gutter section, widening to a four-lane divided roadway, widening to a five-lane curb-and-gutter section, constructing a new location four-lane divided roadway, and lastly, improvements to the highway based on the 3-R Guide. Resurfacing, Restoration, and Rehabilitation of roadway facilities are the primary purposes of the 3-R Guide. The 3-R Guide is an economic method to maintain or improve safety and operation. All other improvements in this study are based on NCDOT highway standards.

This study is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. Historic properties and threatened or endangered species within the project corridor were noted based on mapping from the Department of Environment, Health and Natural Resources – National Heritage Section. The purpose of this study is to describe the proposed project, including costs, and to identify potential problems that may require consideration in the planning and design phases.

II. Need for Project

US 19 is a major connector from I-40 near Jonathan Creek in Haywood County to Jackson, Swain, Graham, and Cherokee Counties of North Carolina. It also connects the far western part of the state with the Blue Ridge Parkway at Soco Gap. US 19 is a scenic route along the Tuckasegee River. Part of it also serves as a school bus route to the Upper Soco and Rough Branch Communities of the Eastern Band of Cherokee Indian Reservation. Approximately 4.5 miles of the 9-mile project are located within the Eastern Band of Cherokee Indian Reservation. Tourism to Cherokee, the Great Smokey Mountain National Park, the Great Smokey Mountain Railroad, and other area attractions brings heavy seasonal traffic. In addition, modest growth can be expected near and in the study area, especially in the area of Harrah's Cherokee Casino, located at the intersection of US 19 and US 441 Business. The economy within the region is based largely on tourism and agriculture. The terrain along US 19 is generally mountainous and the existing roadway is below current standard pavement widths. There are several horizontal curves that are also sub-standard. The Eastern Band of Cherokee Indians strongly supports this project. The purpose of this project is to improve the safety, accessibility, and mobility of the facility.

III. Traffic Operations

US 19, in Swain and Jackson Counties, is designated as a major collector in the North Carolina Statewide Functional Classification System and as a major thoroughfare in both the Bryson City and Cherokee Thoroughfare plans. US 19 is currently a two-lane facility along most of the project, with a short three-lane section through the Central Business District of Bryson City and a short transitional five-lane section at the US 441- South intersection in Cherokee. The development along this road is a combination of agricultural, commercial, residential, and undeveloped land.

The base year 2001 Average Daily Traffic (ADT) on US 19 ranges from 5,800 to 12,800 vehicles per day (vpd). The estimated design year 2025 ADT on US 19 ranges from 13,400 to 29,200 vpd. Truck traffic is expected to make up approximately two percent of daily traffic on the project. With these future traffic volumes, improvements are needed to maintain the traffic-carrying capacity of the roadway.

There are five existing traffic signals within the project limits. Three of these signals are located within the Bryson City limits at US 19 and Slope Street (SR1323); at Main Street (US 19) and Spring Street (SR1159); and at Main Street (US 19) and Everett Street. The other two signals are located at US 19 and US 441-South and at US 19 and US 441-North in Cherokee.

Currently, all major intersections and highway segments along US 19 are operating at a Level of Service (LOS) "F". If no improvements are made to US 19, all major intersections will still be operating at a LOS "F" in design year (DY) 2025. With the recommended improvements to US 19, the facility is anticipated to operate at a LOS "D" or better in DY 2025, with the exception of the three intersections located in Bryson City. These intersections are expected to operate at a LOS "F" without additional improvements to US 19. The improvements that are necessary to provide an adequate level of service for the projected traffic volumes are not feasible through downtown Bryson City because of their adverse property impacts to businesses and historical interests in the Central Business District.

During the three-year period from January 1, 1998 through December 31, 2000 there were 114 accidents reported on the 9-mile portion of US 19 within the study limits. This resulted in an accident rate of 155.79 accidents per 100 million vehicle miles (Acc/100MVM), which is higher than the statewide average of 126.75 Acc/100MVM for Rural U.S. Highways (from 1999 to 2001). There were no fatalities reported during the period, but 52 of the accidents resulted in injuries. There was not a particular prevalent accident type. Eighteen percent of the accidents were Left Turn accidents; 22% were Run Off Road; and 26% were Rear End Collisions. The proposed improvements of the studied alternatives will reduce the potential for these types of traffic accidents.

IV. Studied Alternatives

For the purpose of this report, the project has been divided into six sections. For Sections 3, 4, 5 and 6 there are multiple alternatives considered in this study. Refer to Figure 1 for Section locations. The project Sections are described below:

Section 1: US 19 from Hughes Branch Road (SR1152) in Bryson City To 600' northeast of Everett Street

Existing US 19, at the beginning of Section 1, is a 20-foot wide two-lane shoulder section with varying widths of unpaved shoulders located within the Bryson City central business district (CBD). The existing roadway from approximately 1,000' southwest of Slope Street to 600' northeast of Everett Street is a 3-lane curb-and-gutter section with some adjacent parallel parking. The existing posted speed limit along US 19 in this area varies from 20 to 35 mph. The width of existing right-of-way throughout the project is not constant and is defined as at least the width maintained by the Department of Transportation. Ideally, this section of US 19 would be widened to a 4-lane roadway to improve capacity. However, this is not feasible due to the area's urban nature. Instead, it is recommended to widen US 19 to a 3-lane curb-and-gutter section, 40-foot face to face of curbs with 10-foot berms, for approximately 0.4 miles at the beginning of Section 1, connecting to the existing 3-lane roadway. The widening will improve the accessibility, mobility, and safety of the highway. The remainder of the section has no proposed improvements; only the recommendation to evaluate and optimize the traffic signal system through Bryson City. See Figure 2 for the proposed typical section. A combination of 100' of right-of-way with construction easements is needed to accommodate the proposed improvements.

It is anticipated that **Section 1** improvements will require the relocation of one (1) residence and two (2) businesses. The total cost, including construction and right-of-way, is estimated to be \$ 2,100,000.

Construction.....	\$ 650,000
Right-of-way.....	\$ 1,450,000
Total Cost (Sec. 1).....	\$ 2,100,000

**Section 2: US 19 from 600' northeast of Everett Street
To Shepherds Creek Road (SR1166)**

Existing US 19 in Section 2 is a 20-foot wide two-lane shoulder section with varying widths of unpaved shoulders located within the Bryson City limits. The existing posted speed limit along US 19 is 35 mph and the existing right-of-way is at least the width maintained by the Department of Transportation. This area contains a mix of residential and commercial land uses. Ideally, this section of US 19 would be widened to a 4-lane roadway to improve capacity. However, this is not feasible due to the area's urban nature. Instead, it is recommended to widen US 19 to a 3-lane curb-and-gutter section, 40-foot face to face of curbs with 10-foot berms, for approximately 1.4 miles. Widening Section 2 will improve the accessibility, mobility, and safety of the highway. There are two retaining walls proposed in this section to reduce earthwork and right-of-way costs. A combination of 100' of right-of-way with construction easements is needed to accommodate the proposed improvements. See Figure 2 for the proposed typical section.

It is anticipated that **Section 2** improvements will require the relocation of fifteen (15) residences and twenty-four (24) businesses. The total cost, including construction and right-of-way, is estimated to be \$ 9,000,000.

Construction.....	\$ 2,950,000
Right-of-way.....	\$ 6,050,000
Total Cost (Sec. 2).....	\$ 9,000,000

**Section 3: US 19 from Shepherds Creek Road (SR1166)
To Galbraith Creek Road (SR1351)**

Section 3 proceeds in a northeast direction for approximately 1.0 mile along US 19. Existing US 19 in Section 3 is a 20-foot wide two-lane shoulder section with varying widths of unpaved shoulders. The existing posted speed limit along US 19 is 35 mph from SR1166 to the at-grade railroad crossing just north of the Tuckasegee River and is 45 mph for the remainder of the section. The existing right-of-way is at least the width maintained by the Department of Transportation. The roadway traverses residential and agricultural lands in this area.

Alternative 3-A: 3-R Guideline Improvements Alternative

Alternative 3-A includes minimal improvements such as resurfacing, widening, curve straightening, and adding intersection turn lanes to maintain safety and operation. These improvements are based on NCDOT Highway Design Branch's 3-R Guide (Resurfacing, Restoration, and Rehabilitation). The NCDOT Design Manual's "Volume Warrants For Left-Turn Lanes on Two-Lane Roads" determined left-turn lane additions. There are four sites in this section requiring improvements. They are as follows:

- ◆ Site 1) Add a westbound left-turn lane to turn onto Shepherds Creek Road (SR1166).
- ◆ Site 2) Relocate and Realign the bridge over the Tuckasegee River. Add a westbound left-turn lane to turn onto Walker Woody Road (SR1168). The relocation includes a proposed retaining wall prior to the river crossing and a new at-grade railroad crossing after the river crossing.
- ◆ Site 3) Upgrade the horizontal curve near Johnson Branch Road (SR1350) to 45 mph.
- ◆ Site 4) Upgrade the horizontal curve near Galbraith Creek Road (SR1351) to 45 mph.

Sites 1 and 2 will require 100' of right-of-way and construction easements to construct the 42-foot wide 3-lane bridge and the 36-foot wide 3-lane shoulder sections. The remaining portion of US 19 (including sites 3 and 4) will be widened and resurfaced to a 24-foot two-lane shoulder section with 6' grass shoulders. The two-lane widening shall be on 60' right-of-way with 10-foot construction easements. See Figure 3 for 3-R typical sections.

It is anticipated that **Section 3-A** improvements will require the relocation of seven (7) residences and two (2) businesses. The total cost, including construction and right-of-way, is estimated to be \$ 11,400,000.

Construction.....	\$ 8,500,000
<u>Right-of-way.....</u>	<u>\$ 2,900,000</u>
Total Cost (Alt. 3-A).....	\$ 11,400,000

Alternative 3-B: Four-Lane Divided Widening Alternative

A 4-lane divided curb-and-gutter section with 12-foot lanes, a 23-foot raised grass median, 75-foot face to face of curbs and 10-foot berms is recommended for Alternative 3-B. The widening will take place primarily to the east of the existing roadway and utilize as much of the existing pavement as possible. This alternative includes the alignment, bridge re-placement, and intersection improvements listed in Alternative 3-A. A new 5-lane structure over the Tuckasegee River is recommended in this alternative. Alternative 3-B also includes a proposed retaining wall previous to the Tuckasegee River crossing and a new at-grade railroad crossing northeast of the river crossing. This alternative meets a 45 mph design speed. A 150' right-of-way plus construction easements are needed to construct the recommended typical section. See Figures 2 and 3 for proposed typical sections.

It is anticipated that **Section 3-B** improvements will require the relocation of ten (10) residences and seven (7) businesses. The total cost, including construction and right-of-way, is estimated to be \$ 15,300,000.

Construction.....	\$ 13,200,000
<u>Right-of-way.....</u>	<u>\$ 2,100,000</u>
Total Cost (Alt. 3-B).....	\$ 15,300,000

Alternative 3-C: Four-Lane Divided New Location Alternative

A 4-lane divided shoulder section on new location with 12-foot lanes, a 23-foot raised grass median, and 8-foot shoulders (4 feet of which are paved) is recommended for Alternative 3-C. Alternative 3-C bypasses a residential area through farmland in order to minimize community impacts. A new 5-lane structure over the Tuckasegee River is recommended in this alternative. Alternative 3-C also includes a proposed retaining wall previous to the Tuckasegee River crossing and a new at-grade railroad crossing northeast of the river crossing. The new location alignment ties back into the existing alignment at Galbraith Creek Road (SR1351). Alternative 3-C meets or exceeds a 50 mph design speed. A 150' right-of-way plus construction easements are needed to construct the recommended typical section. See Figure 3 for proposed typical sections.

It is anticipated that **Section 3-C** improvements will require the relocation of four (4) residences and two (2) businesses. The total cost, including construction and right-of-way, is estimated to be \$ 29,500,000.

Construction.....	\$ 27,900,000
<u>Right-of-way.....</u>	<u>\$ 1,600,000</u>
Total Cost (Alt. 3-C).....	\$ 29,500,000

**Section 4: US 19 from Galbraith Creek Road (SR1351)
To 2,100' northeast of Luftee Lake Road (SR1372)**

Section 4 proceeds northeast for approximately 3.2 miles along US 19 and is located within the Eastern Band of Cherokee Indian Reservation. Existing US 19 in Section 4 is a 20-foot wide two-lane shoulder section with varying widths of unpaved shoulders. The existing posted speed limit is 45 mph and the right-of-way is at least the width maintained by the Department of Transportation. The roadway travels through residential and agricultural lands. Kituhwa (Governor's Island), an archaeological site, is located off of the eastern side of US 19 at the beginning of Section 4. The Southern Railway railroad tracks also follow along the eastern side of the roadway for the first mile of the section.

Alternative 4-A: 3-R Guideline Improvements Alternative

Alternative 4-A includes minimal improvements such as resurfacing, widening, curve straightening, and adding intersection turn lanes to maintain safety and operation. These improvements are based on NCDOT Highway Design Branch's 3-R Guide. There are four sites in this section requiring improvements. They are as follows:

- ◆ Site 5) Remove the reverse curve (approximately where the Southern Railway diverges and bridges the Tuckasegee River).
- ◆ Site 6) Upgrade the horizontal curve at Cooper Creek west of Hyatt Creek Rd. (SR1168) to 45 mph.
- ◆ Site 7) Add a westbound left-turn lane to turn onto Hyatt Creek Road (SR1168).
- ◆ Site 8) Add a westbound left-turn lane to turn onto US 19A.

Site 8 improvements include a proposed retaining wall across from the US 19A and Dam Road (SR1358) intersections that avoids Sherrill Cemetery and a steep mountainside cut. Sites 7 and 8 will require 100' of right-of-way with construction easements to construct the 36-foot wide 3-lane shoulder sections. The remaining portion of US 19 (including sites 5 and 6) will be widened and resurfaced to a 24-foot two-lane shoulder section with 6' grass shoulders. The two-lane widening shall be on 60' right-of-way with 10-foot construction easements. See Figure 3 for 3-R typical sections.

It is anticipated that **Section 4-A** improvements will require the relocation of sixteen (16) residences and twelve (12) businesses. The total cost, including construction and right-of-way, is estimated to be \$ 6,300,000.

Construction.....	\$ 3,650,000
<u>Right-of-way.....</u>	<u>\$ 2,650,000</u>
Total Cost (Alt. 4-A).....	\$ 6,300,000

Alternative 4-B: Four-Lane Divided Widening Alternative

A 4-lane divided shoulder section with 12-foot lanes, a 23-foot raised grass median, and 8-foot shoulders (4 feet of which are paved) is recommended for Alternative 4-B. The widened section will utilize as much of the existing pavement as possible. This alternative also includes the alignment and intersection improvements listed in Alternative 4-A. Alternative 4-B includes 4 total proposed retaining walls; one along the parallel railroad, two along steep mountainsides, and the one described in Alternative 4-A. Alternative 4-B meets or exceeds a 45 mph design speed. A 150' right-of-way plus construction easements are needed to construct the recommended typical section. See Figure 2 for proposed typical sections.

It is anticipated that **Section 4-B** improvements will require the relocation of thirty-five (35) residences and twenty-one (21) businesses. The total cost, including construction and right-of-way, is estimated to be \$ 33,000,000.

Construction.....	\$ 23,600,000
<u>Right-of-way.....</u>	<u>\$ 9,400,000</u>
Total Cost (Alt. 4-B).....	\$ 33,000,000

Alternative 4-C: Four-Lane Divided New Location Alternative

A 4-lane divided shoulder section on new location with 12-foot lanes, a 23-foot raised grass median, and 8-foot shoulders (4 feet of which are paved) is recommended for Alternative 4-C. The first 2,500' of this alternative is along the existing US 19 alignment. Alternative 4-C then bypasses the Ela community through farmland and forest in order to minimize community impacts. Two 30-foot wide dual bridges are proposed in this alternative. The first proposed dual bridges cross over the Southern Railway, the Tuckasegee River and Hyatt Creek Road (SR 1168) and are approximately 1,000' long. The second dual bridges cross over the Southern Railway, the Tuckasegee River and existing US 19 and are approximately 1,285' long. There are also two retaining walls proposed in this alternative; one along the parallel railroad and one along the Cooper Cemetery mountainside. This alternative meets or exceeds a 50 mph design speed. A 150' right-of-way plus construction easements are needed to construct the recommended typical section. See Figure 3 for proposed typical sections.

It is anticipated that **Section 4-C** improvements will require the relocation of one (1) residence and zero (0) businesses. The total cost, including construction and right-of-way, is estimated to be \$ 33,500,000.

Construction.....	\$ 30,800,000
<u>Right-of-way.....</u>	<u>\$ 2,700,000</u>
Total Cost (Alt. 4-C).....	\$ 33,500,000

Section 5: US 19 from 2,100' northeast of Luftee Lake Road (SR1372) To Owl Branch Road (BIA Hwy. 427)

Section 5 proceeds northeast for approximately 3.1 miles along US 19 and is located within the Eastern Band of Cherokee Indian Reservation. Existing US 19 in Section 5 is a 20-foot wide two-lane shoulder section with varying widths of unpaved shoulders. The existing posted speed limit is 45 mph and the right-of-way is at least the width maintained by the Department of Transportation. The roadway travels through residential and agricultural lands. The Oconaluftee River follows along the southeastern side of the roadway through the section.

Alternative 5-A: 3-R Guideline Improvements Alternative

Alternative 5-A includes minimal improvements such as resurfacing, widening, curve straightening, and adding intersection turn lanes to maintain safety and operation. These improvements are based on NCDOT Highway Design Branch's 3-R Guide. There are six sites in this section requiring improvements. They are as follows:

- ◆ Site 9) Upgrade the horizontal curve to 45 mph (approximately 900' north of Section 4).
- ◆ Site 10) Add left-turn lanes on both approaches to Goose Creek Road (BIA Hwy. 1445).
- ◆ Site 11) Add an eastbound left-turn lane to turn onto McCoy Branch Rd (BIA Hwy. 431).
- ◆ Site 12) Add an eastbound left-turn lane to turn onto BIA Hwy. 438.
- ◆ Site 13) Add an eastbound left-turn lane to turn onto BIA Hwy. 417.
- ◆ Site 14) Add an eastbound left-turn lane to turn onto Owl Branch Road (BIA Hwy. 427).

Sites 10 through 14 will require 100' of right-of-way with construction easements to construct the 36-foot wide 3-lane shoulder sections. The remaining portion of US 19 (including site 9) will be

widened and resurfaced to a 24-foot two-lane shoulder section with 6' grass shoulders. The two-lane widening shall be on 60' right-of-way with 10-foot construction easements. See Figure 3 for 3-R typical sections.

It is anticipated that **Section 5-A** improvements will require the relocation of thirteen (13) residences and four (4) businesses. The total cost, including construction and right-of-way, is estimated to be \$ 5,200,000.

Construction.....	\$ 2,800,000
<u>Right-of-way.....</u>	<u>\$ 2,400,000</u>
Total Cost (Alt. 5-A).....	\$ 5,200,000

Alternative 5-B: Four-Lane Divided Widening Alternative

A 4-lane divided shoulder section with 12-foot lanes, a 23-foot raised grass median, and 8-foot shoulders (4 feet of which are paved) is recommended for Alternative 5-B. The widening will take place on the northwest side of the existing roadway (away from the Oconaluftee River) and utilize as much of the existing pavement as possible. Alternative 5-B also includes the alignment and intersection improvements listed in Alternative 5-A. There is one retaining wall in this alternative that prevents a steep mountainside cut. Alternative 5-B meets or exceeds a 45 mph design speed with the exception of one curve that meets a 40 mph design speed and is not feasible to improve. A 150' Right-of-Way plus construction easements are needed to construct the recommended typical section. See Figure 2 for proposed typical sections.

It is anticipated that **Section 5-B** improvements will require the relocation of nineteen (19) residences and thirteen (13) businesses. The total cost, including construction and right-of-way, is estimated to be \$ 28,800,000.

Construction.....	\$ 21,800,000
<u>Right-of-way.....</u>	<u>\$ 7,000,000</u>
Total Cost (Alt. 5-B).....	\$ 28,800,000

Section 6: US 19 from Owl Branch Road (BIA Hwy. 427) to US 441-North in Cherokee

Section 6 proceeds northeast for approximately 0.8 miles along US 19 and is located within the Eastern Band of Cherokee Indian Reservation. Section 6 ends at the intersection of US 19 and US 441-North in Cherokee. US 19 transitions from a 20-foot wide two-lane shoulder section to a 5-lane curb-and-gutter section at the US 441-South intersection. The remainder of Section 6 to US 441-North is a 3-lane section. The existing posted speed limit reduces to 35 mph near Owl Branch Road (BIA Hwy. 427). The existing right-of-way width varies and is at least the width maintained by the Department of Transportation. This area contains a mix of residential and commercial land uses, including several hotels west of US 441-South.

Alternative 6-A: Four-Lane Divided Curb and Gutter Widening Alternative

A 4-lane divided shoulder section with 12-foot lanes, a 23-foot raised grass median and 8-foot shoulders (4 feet of which are paved) on 150' of right of way with construction easements, transitioning to a 4-lane divided curb and gutter section with an 18' raised grass median 70' face to face of curbs with 10' berms on 100' of right of way with construction easements is recommended for Alternative 6-A. The widening will take place primarily to the north of the existing roadway and utilize as much of the existing pavement as possible. There are two retaining walls included in this alternative; one along the Hampton Inn property on the north side of US 19, and one in front of the convenience store on the north side of US 19 at the US 441-North intersection. Alternative 6-A should meet or exceed a 50 mph design speed. See Figure 2 for proposed typical sections.

It is anticipated that **Section 6-A** improvements will require no residential or business relocations. The total cost, including construction and right-of-way, is estimated to be \$ 4,400,000.

Construction.....	\$ 3,900,000
Right-of-way.....	\$ 500,000
Total Cost (Alt. 6-A).....	\$ 4,400,000

Alternative 6-B: Five-Lane Curb-and-Gutter Widening Alternative

A 4-lane divided shoulder section with 12' lanes, a 23' raised grass median and 8-foot shoulders (4 feet of which are paved) on 150' of right of way with construction easements, transitioning to a 5-lane curb-and-gutter section with 12-foot lanes, 64-foot face to face of curbs and 10-foot berms on 100' of right-of-way with construction easements is proposed for Alternative 6-B. A 0.2-mile portion of the 0.8-mile section (at the US 441-South intersection) is currently a 5-lane section. The widening will utilize as much of the existing pavement as possible. There are two retaining walls included in this alternative; one at the Hampton Inn and one at the convenience store at the US 441-North intersection. Alternative 6-B meets or exceeds a 50 mph design speed. See Figure 2 for proposed typical sections.

It is anticipated that **Section 6-B** improvements will require no residential or business relocations. The total cost, including construction and right-of-way, is estimated to be \$ 3,800,000.

Construction.....	\$ 3,300,000
Right-of-way.....	\$ 500,000
Total Cost (Alt. 6-B).....	\$ 3,800,000

V. Project Costs & Recommendations

The following tables show total project costs for various combinations of alternative improvements. Table 1 shows the least expensive total project cost. This combination of improvements includes three-lane widening in Sections 1 and 2; 3-R improvements in Sections 3, 4, and 5; and five-lane widening in Section 6.

Table 1. Low Cost			
Section	Right-of-Way Cost	Construction Cost	Total Section Cost
S-1	\$ 1,450,000	\$ 650,000	\$ 2,100,000
S-2	\$ 6,050,000	\$ 2,950,000	\$ 9,000,000
S-3A	\$ 2,900,000	\$ 8,500,000	\$ 11,400,000
S-4A	\$ 2,650,000	\$ 3,650,000	\$ 6,300,000
S-5A	\$ 2,400,000	\$ 2,800,000	\$ 5,200,000
S-6B	\$ 500,000	\$ 3,300,000	\$ 3,800,000
Total Cost:			\$ 37,800,000

Table 2 shows the most expensive total project cost. This combination of improvements includes three-lane widening in Sections 1 and 2; four-lane new location in Sections 3 and 4; and four-lane widening in Sections 5 and 6.

Table 2. High Cost			
Section	Right-of-Way Cost	Construction Cost	Total Section Cost
S-1	\$ 1,450,000	\$ 650,000	\$ 2,100,000
S-2	\$ 6,050,000	\$ 2,950,000	\$ 9,000,000
S-3C	\$ 1,600,000	\$ 27,900,000	\$ 29,500,000
S-4C	\$ 2,700,000	\$ 30,800,000	\$ 33,500,000
S-5B	\$ 7,000,000	\$ 21,800,000	\$ 28,800,000
S-6A	\$ 500,000	\$ 3,900,000	\$ 4,400,000
			Total Cost: \$ 107,300,000

Table 3 shows the recommended improvements total project cost. This combination of improvements includes three-lane widening in Sections 1 and 2; four-lane widening in Sections 3 and 5; four-lane new location in Section 4; and four-lane divided widening in Section 6.

Table 3. Recommended Improvements Cost			
Section	Right-of-Way Cost	Construction Cost	Total Section Cost
S-1	\$ 1,450,000	\$ 650,000	\$ 2,100,000
S-2	\$ 6,050,000	\$ 2,950,000	\$ 9,000,000
S-3B	\$ 2,100,000	\$ 13,200,000	\$ 15,300,000
S-4C	\$ 2,700,000	\$ 30,800,000	\$ 33,500,000
S-5B	\$ 7,000,000	\$ 21,800,000	\$ 28,800,000
S-6A	\$ 500,000	\$ 3,900,000	\$ 4,400,000
			Total Cost: \$ 93,100,000

The following are the **recommended improvements** to each section. They correspond to the recommended costs listed in Table 3.

It is recommended that **Section 1** be widened to a 3-lane section. Section 1 improvements tie into the existing 3-lane section in the Bryson City central business district and provide left-turn lanes to SR1152, the Swain County School Bus Garage, and the Ingle's grocery store. US 19 needs to be widened to a 4-lane roadway to provide an adequate level of service for the projected traffic volumes, but this is not feasible due to the area's urban nature. Although the recommended improvements do not improve capacity, removing left-turning vehicles from the through-moving travel way should improve the operation. An evaluation to optimize the traffic signal system through Bryson City is recommended as well. These recommended improvements should improve accessibility and safety and provide a continuous section through Bryson City.

It is recommended that **Section 2** be widened to a 3-lane section. Section 2 improvements tie into the existing 3-lane section in downtown Bryson City. The recommended improvements should improve safety and operation by removing left-turning movements from the through traffic at the many residences and businesses in this section. The recommended improvements also provide continuity through Bryson City to SR 1166.

Alternative 3-B (4-lane divided widening) is recommended for **Section 3**. There is less impact on the mountain located on the southeastern side of the roadway just prior to the river in comparison to Alternative 3-C, the new location alternative. The structure over the Tuckasegee River is on a tangent (as opposed to Alternative 3-C which is on a curve). The impact on the community is minimal and there is also minimal impact on the farmland on the eastern side of US 19. Each of these contributes to Alternative 3-B's less total cost and superiority to Alternative 3-C. Its improvements are also superior to the 3-R improvements because of the improved capacity and safety of the roadway. The projected future traffic requires a four-lane facility to provide an adequate level of service in the design year. Divided roadways also provide safer facilities than undivided roadways. Therefore, Alternative 3-B is the best recommendation for this section of US 19.

Alternative 4-C (4-lane divided new location) is recommended for **Section 4**. The impact on the community for the 4-lane widening alternative would be much more significant in this section than in Section 3. Many residences, several recreational campgrounds, and a church in the Ela community lie close to the roadside and would be negatively impacted or relocated as a result of the widening. The new location alternative traverses mostly uninhabited farmland. Refer to page 7 of the report for a comparison of relocatees, right-of-way costs, and total alternative costs. Although Alternative 4-C includes two long structures it is not much higher in cost than the 4-lane widening alternative because of the difference in right-of-way costs. The anticipated benefit to the community outweighs the cost difference of the new location alternative. The 4-lane divided new location alternative is superior to the 3-R improvements alternative because it improves the capacity and the safety of the roadway. It also provides an adequate level of service in the design year. The new location alternative has a higher design speed and should provide a higher level of service than either the widening or the 3-R improvements alternatives. Therefore, Alternative 4-C is the best recommendation for this section of US 19.

Alternative 5-B (4-lane divided widening) is recommended for **Section 5**. The recommended improvements should improve safety and operation for through moving traffic and turning traffic at intersections. These improvements are superior to the 3-R improvements because they improve the capacity and the safety of the roadway. They also provide an adequate level of service in the design year. Alternative 5-B is the best recommendation for this section of US 19.

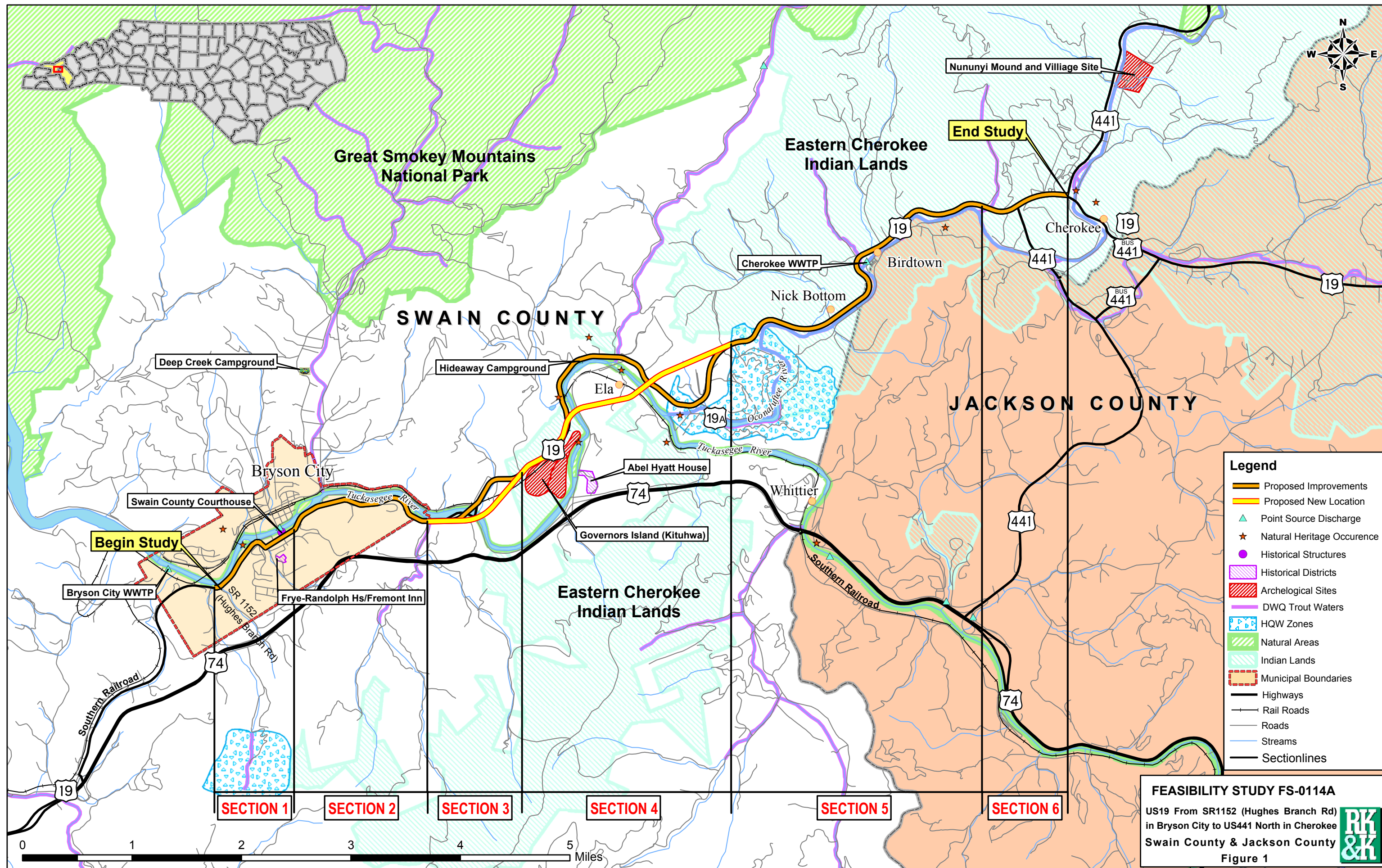
Alternative 6-A (4-lane divided curb-and-gutter widening) is recommended for **Section 6**. This alternative provides continuity in roadway type with the majority of this study project. The US-441-North intersection serves as an optimal location to transition back to the existing 5-lane section as US 19/ US 441-Business travels through the a highly developed section of Cherokee as well as Maggie Valley. In addition, the divided section is historically a safer roadway type and is capable of moving larger traffic volumes in a more efficient manner. The best recommendation for this section, therefore, is Alternative 6-A

The **total project cost** for the recommended alternatives as described in the section above is **\$93,100,000**.

VI. Additional Comments

A detailed environmental study was not conducted for this feasibility study. However, based on mapping from the Department of Environment, Health and Natural Resources – National Heritage Section, one threatened or endangered species was identified in the project corridor (see note below). In addition, no historic properties are anticipated to be impacted by the recommended alternatives. The following items are identified as needing more detailed analyses during future planning and/or design phases:

- ◆ Although it is needed for traffic capacity, it should be noted that a 4-lane section through Bryson City would result in adverse property impacts to businesses and historical interests and is therefore considered not practical or feasible. These impacts could be furthered quantified and studied in later planning phases.
- ◆ There were no feasible new location alternatives in Sections 1, 2, 5, and 6 to be considered in the study.
- ◆ Further study of the signalized intersections in Bryson City should be conducted to achieve optimal coordination and operation. More detailed investigation of the need for traffic signals throughout the project should also be conducted.
- ◆ Several retaining walls are proposed at various locations in Sections 3, 4, 5, and 6 to reduce earthwork and right-of-way costs and cemetery impacts. A preliminary cost comparison was made at each location and resulting costs are included in each Section's total costs.
- ◆ There is an endangered plant species located near site 5 in Section 4 (approximately where Galbraith Creek crosses existing US 19). The location will not be impacted by the recommended improvements. The *Synandra Hispidula*, a vascular plant, is classified as significantly rare and was last observed in 1935.
- ◆ T.I.P. B-4696 includes widening the bridge over the Oconaluftee River to a 5-lane section at the study limits in Cherokee. The roadway section beyond the bridge is also a 5-lane section. Recommended improvements in this study will create a more consistent roadway section through Swain and Jackson Counties thereby generating better traffic operation.
- ◆ Eastern Band of Cherokee Indians, Bryson City, and Swain County officials have expressed great interest in safety and operational improvements to this portion of US 19.
- ◆ Winter weather and shaded, mountainous areas contribute to unsafe, icy locations on US 19. The recommended improvements will help to open up previously shaded areas on the roadway.
- ◆ There are overhead utilities throughout the majority of the project with some transmission lines lying within unusual topography. The impact to utilities is expected to be high.



FEASIBILITY STUDY FS-0114A
 US19 From SR1152 (Hughes Branch Rd) in Bryson City to US441 North in Cherokee
 Swain County & Jackson County
 Figure 1



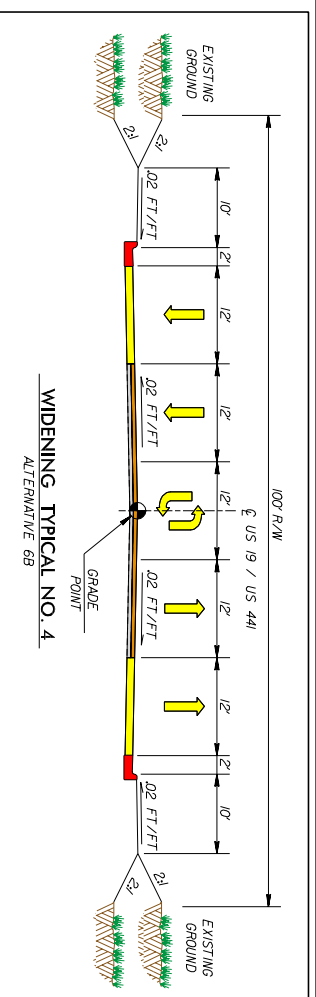
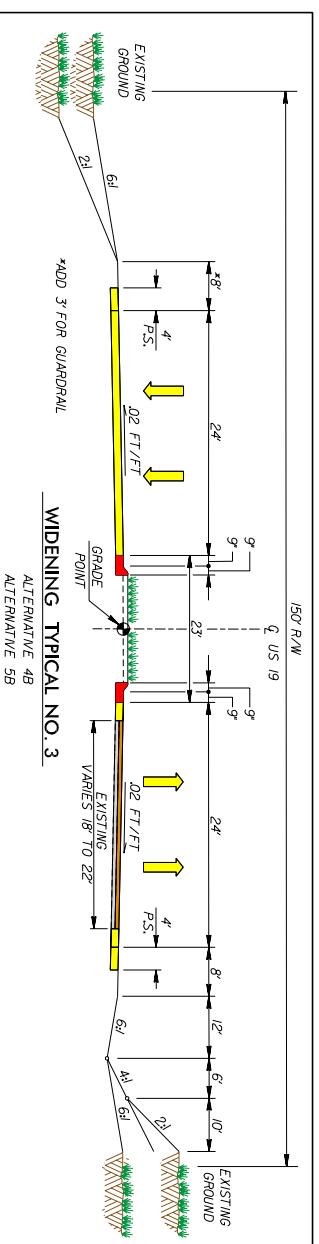
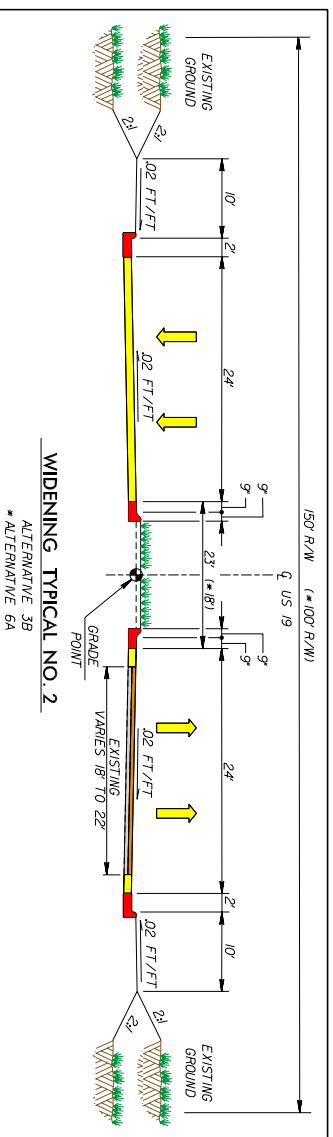
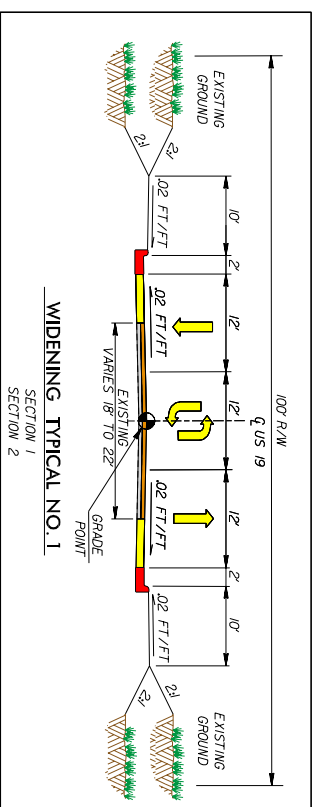


FIGURE 2

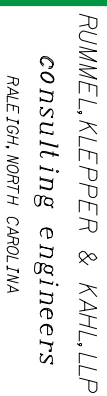


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NCDOT FEASIBILITY STUDY FS-0114A
US 19 FROM SR 1152 IN BRYSON CITY
TO US 441 NORTH IN CHEROKEE,
SWAIN / JACKSON COUNTY

PROGRAM DEVELOPMENT BRANCH
N.C. DEPARTMENT OF TRANSPORTATION
P.O. BOX 25201
RALEIGH, NC 27611





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FIGURE 3

